

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Reissue Application of :  
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Duane Charles GATES :   
:   
Serial No. 09/534,814 : Group Art Unit: 3742  
(Reissue application of :   
U.S. Patent 5,731,565) : Examiner: M. Paschall  
:   
Filed: March 22, 2000 :   
:   
For: SEGMENTED COIL FOR GENERATING PLASMA  
IN PLASMA PROCESSING EQUIPMENT

**COMBINED SUPPLEMENTAL DECLARATION AND POWER OF ATTORNEY  
IN REISSUE APPLICATION**

Assistant Commissioner for Patents  
Washington, DC 20231

Sir:

As a below-named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name; and  
that

I verily believe that I am the original and first inventor of the subject matter which is described and claimed in patent number 5,731,565, granted March 24, 1998 and for which a reissue patent is sought on the invention entitled SEGMENTED COIL FOR GENERATING PLASMA IN PLASMA PROCESSING EQUIPMENT, described and claimed in the Reissue Application Number 09/534,814, filed March 22, 2000, and was amended November 7, 2001, February 7, 2002,

August 21, 2002, May 24, 2004, September 22, 2004, April 17, 2006 and November 25, 2011; that I understand the content of the specification filed therein; that I have reviewed and understand the content of the specification including the claims, as well as the claims, as amended by any amendment referred to above; that I do not know and do not believe the same was ever known or used in the United States of America before my invention thereof, or patented or described in any printed publication in any country before my invention thereof or more than one year prior to July 27, 1995; that the same was not in public use or on sale in the United States of America more than one year prior to July 27, 1995; that the invention has not been patented or made the subject of an inventor's certificate issued before July 27, 1995, in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months prior July 27, 1995. I acknowledge my duty to disclose information which is material to patentability as defined in 37 CFR 1.56. I hereby declare that no application for patent or inventor's certificate on this invention has been filed in any country foreign to the United States of America prior to the original application Serial No. 08/507,971 by me or my legal representatives or assigns. My original U.S. Patent 5,731,565, issued March 24, 1998, which matured from Serial No. 08/507,971 filed July 27, 1995, is believed to be wholly or partly inoperative because I claimed less than I had a right to claim through error and without any deceptive intention. Every error in the patent which was corrected in the present reissue application, and is not covered by a prior oath/declaration submitted in this application, arose without any deceptive intention on my part.

The errors include the following:

1. The use of improper antecedents in claim 1.
2. The failure to claim the subject matter of amended claims 39–56 of the Reissue

Application. In particular, the failure to include a claim of the scope defined by independent claim 39, upon which claims 40–44 depend, that the interior, intermediate and peripheral coil portions have turns connected to each and arranged so the magnet flux density coupled to the plasma by the interior and peripheral coil portions exceeds the magnetic flux coupled to the plasma by the intermediate coil portion.

3. The error also includes the failure to include a claim of the scope defined by independent claim 45, upon which claims 46–50 depend, that the intermediate and peripheral portions of the coil have turns connected to each other and arranged so the magnetic flux density coupled to the plasma by each of the interior and peripheral coil portions exceeds the magnetic flux density coupled to the plasma by the intermediate coil portion.

4. The error also includes the failure to include a claim of the scope defined by independent claim 51, upon which claims 52 and 53 depend, that the interior coil portion includes (1) plural radially and circumferentially extending turns, (2) an exterior coil portion having at least one circumferentially extending turn, and (3) an intermediate coil portion configured so it (a) does not include a complete turn, (b) is substantially less than a complete turn, and (c) includes a lead connected to ends of the interior and exterior portions, wherein at least a portion of the lead is straight.

5. The error also includes the failure to include a claim of the scope defined by independent claim 54, upon which claims 55 and 56 depend, that an intermediate coil portion be configured so (1) it does not include a complete turn, (2) is substantially less than a complete turn, and (3) includes a lead connected to the ends of the turns of the interior and exterior portions, wherein at least a portion of the lead is straight.

6. The error also includes the failure to include the foregoing features of the independent claims in various combinations defined in the dependent claims. For example, claim 40 requires the interior coil portion to include radially and circumferentially extending turns, and the exterior segments to have at least one circumferentially extending turn. The intermediate portion is configured so it (a) does not include a complete turn, (b) is substantially less than a complete turn, and (c) includes a lead connected to ends of the turns of the interior and exterior portions. Similar limitations to those set forth in claim 40 are set forth in claim 46, which depends on claim 45.

7. The error also includes the failure to include claims of the scope defined in dependent claims 41, 47, 52 and 55 with the requirements for the interior, intermediate and exterior coil portions to be connected in series, with the exterior and interior portions respectively including terminals for connection to a source of RF.

8. The error also includes inclusion in claim 1 of the patent, upon which claims 2-19 depend, the requirement for a power distributing component that is connected to one of first and second coil segments for controlling the flow of radio frequency current from an rf source through the first and second coil segments so different maximum radio frequency current amplitudes selectively flow from the source through the first and second coil segments at the same time to cause process gas introduced into a chamber to be excited into a plasma having a relatively uniform plasma density in an area spanned by the first and second coil segments.

9. The error also includes inclusion in claim 20 of the patent, upon which claims 21-25 depend, the requirement for selectively controlling the maximum amplitude of radio frequency current flowing through first and second coil segments in a manner such that plasma has a uniform

plasma density in an area spanned by the first and second coil segments.

10. The error also includes inclusion in claim 26 of the patent, upon which claims 27 and 28 depend, the requirement for first and second coil segments to be connected to a radio frequency source arrangement and arranged so a lower radio frequency maximum amplitude current from the source arrangement flows through the first coil segment than through the second coil segment, wherein the radio frequency fields derived from the first and second coil segments interact with process gas introduced into a chamber so the process gas is excited to form a plasma having a relatively uniform plasma density in an area spanned by the first and second coil segments.

11. The error also includes inclusion in claim 29 of the patent, upon which claims 30-38 depend, the requirements for (1) effectively arranging, during a first interval while an excited plasma has a first characteristic, first and second segments of a coil in a first way and supplying radio frequency current to the coil so the radio frequency electromagnetic field coupled by the coil to the plasma has a first spatial configuration and amplitude to cause the plasma to have a first substantially uniform density, and (2) during a second interval while the excited plasma has a second characteristic, effectively arranging the segments in a second way and supplying radio frequency current to the coil so the radio frequency electromagnetic field coupled by the coil to the plasma has a second spatial configuration and amplitude to cause the plasma to have a second substantially uniform density, wherein the first and second characteristics, ways, and configurations differ.

I hereby appoint the following attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

**Serial No. 09/534,814**

Allan M. Lowe, Reg. No. 19,641; Benjamin J. Hauptman, Reg. No. 29,310; Kenneth M. Berner, Reg. No. 37,093; and Randy A. Noranbrock, Reg. No. 42,940, all of Lowe Hauptman Ham & Berner, LLP; and Michael Brandt, Reg. No. 39,119, of Lam Research Corporation.

All future correspondence connected therewith should be addressed to the following address:

Allan M. Lowe  
LOWE HAUPTMAN GILMAN & BERNER, LLP  
1700 Diagonal Road, Suite 310  
Alexandria, Virginia 22314

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole inventor: Duane Charles GATES

Inventor's signature: *Duane Charles Gates*

Date: Nov. 23, 2011

Citizenship: U.S.A.

Post Office Address and Residence: 94 Stowbridge Court, Danville, CA 94526